

INTERNATIONAL SEARCH REPORT

Application No

PCT/NL 03/00049

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/61 C12N15/54 C12N1/14 C12N1/19 C12P7/10
 C12P7/20 C12P7/46 C12P7/54 C12P7/56 C12P13/04
 C12P35/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

SEQUENCE SEARCH, BIOSIS, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 'Online! 3 March 2000 (2000-03-03) OP DEN CAMP H.J.M.: "Piomyces sp. E2 mRNA for xylose isomerase (xylA gene)" Database accession no. AJ249909 XP002201310 the whole document	13
X	DATABASE EMBL 'Online! 3 March 2000 (2000-03-03) OP DEN CAMP H.J. M.: "Piomyces sp. E2 mRNA for D-xylulokinase (xylB gene)" Database accession no. AJ249910 XP002201311 the whole document	14

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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

T later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the International search

26 June 2003

Date of mailing of the International search report

03/07/2003

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Initial Application No
PCT/NL 03/00049

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 24667 A (PRIMALCO LTD ;SUOMALAINEN IRMA (FI); AHO SIRPA (US); SAARELAINEN R) 15 August 1996 (1996-08-15)	1-4,6, 13,15,16
Y	abstract page 1 -page 4 SEQ ID NO:1, 2 page 15, last paragraph; claims 1-15	7-12,19, 20
X	US 5 935 837 A (RASMUSSEN MICHAEL DOLBERG) 10 August 1999 (1999-08-10) abstract column 6, paragraphs 2,3; claims 1-13	1-6,13
X	ZALDIVAR J ET AL: "Fuel ethanol production from lignocellulose: A challenge for metabolic engineering and process integration." APPLIED MICROBIOLOGY AND BIOTECHNOLOGY, vol. 56, no. 1-2, July 2001 (2001-07), pages 17-34, XP002201309 ISSN: 0175-7598 cited in the application	17,18
Y	the whole document	8-12,19, 20
Y	US 5 858 764 A (DE HOLLANDER JOHANNES ABRAHAM ET AL) 12 January 1999 (1999-01-12) column 5, last paragraph column 6, last paragraph claim 3	7
A	TEUNISSEN M J ET AL: "PRODUCTION OF CELLULOLYTIC AND XYLANOLYTIC ENZYMES DURING GROWTH OF THE ANAEROBIC FUNGUS PIROMYCES-SP ON DIFFERENT SUBSTRATES" JOURNAL OF GENERAL MICROBIOLOGY, vol. 138, no. 8, 1992, pages 1657-1664, XP001080161 ISSN: 0022-1287 the whole document	1-20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NL 03/00049**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-13, 15-20

nucleic acid construct comprising a nucleotide sequence encoding a xylose isomerase, host cell transformed with said construct and process for producing ethanol comprising fermenting a medium containing a source of xylose with a transformed host cell.

2. Claim : 14

nucleic acid construct comprising a nucleotide sequence encoding a xylulose kinase.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 03/00049

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9624667	A	15-08-1996	EP 0804560 A1 WO 9624667 A1	05-11-1997 15-08-1996
US 5935837	A	10-08-1999	NONE	
US 5858764	A	12-01-1999	US 5190877 A AT 140970 T AU 2186888 A CA 1335264 C DE 3855453 D1 DE 3855453 T2 DK 490588 A EP 0306107 A2 ES 2092467 T3 FI 884064 A GR 3021138 T3 IE 76719 B1 IL 87661 A JP 1153082 A JP 2683253 B2 NO 883919 A ,B, NZ 226020 A OA 8910 A PT 88394 A ,B ZA 8806550 A CN 1035678 A ,B	02-03-1993 15-08-1996 09-03-1989 18-04-1995 05-09-1996 09-01-1997 04-03-1989 08-03-1989 01-12-1996 04-03-1989 31-12-1996 05-11-1997 15-03-1993 15-06-1989 26-11-1997 06-03-1989 26-02-1991 31-10-1989 31-07-1989 30-05-1989 20-09-1989